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The proposition is made [Appendix, p. 956], to unite the Zygosporeæ and the Oosporeæ, because of the apparent extension of the Fucoideæ and Siphoneæ into these two groups. Another suggestive paragraph on p. 956, gives a short account of DeBary's views respecting the affinities of the groups of the higher Fungi, as expressed in his Beiträge (No. 4, 1881). After giving other apparent relationship, it is stated that "the Uredineæ form one of the more highly developed groups of the Ascomycetous series," exactly the position which we have assigned them. (Botany, p. 310, *et seq.*)

The mechanical execution of the volume is similar to that of the first edition, there being the same clear type, and excellently printed figures. Of the latter there are thirty-one more than in the previous edition. To say that there are no errors or inconsistencies of translation or editing, would be to claim a perfection impossible in so large a volume. The work has been so well done that every botanist in this country may well thank the editor for his labor. However, a few things might have been avoided; for example, on p. 62, the term "metabolism" is used instead of "metastasis," and it is there stated that it "will be adopted in the following pages," but upon turning to page 703, one finds "Assimilation and Metastasis" as in the old edition. There is, moreover, a great difficulty in distinguishing between the foot-notes added by the editors of the first and second editions. These, however, are but small blemishes in a great and valuable work.—*C. E. B.*

DISPOSITION OF THE CERVICAL VERTEBRÆ OF CHELONIANS.[1]—M. Vaillant has here given to the world the results of his studies of the cervical vertebræ of nearly fifty species of Chelonians, including *Emys ornata*, *Testudo sulcata*, *Cinosternum pennsylvanicum*, *Thalassochelys caretta*, *Chelodina longicollis*, *Sternothœrus castaneus*, and *Trionyx javanicus*, and thus ranging through all the principal groups of the order.

This portion of the skeleton has heretofore been but little studied, and our author reviews all previous notices of it in the most thorough manner. The variations in structure are greater than would be expected in so homogeneous an order, yet are correlated with the habits of the various species, dependant in all cases upon their mobile neck for the power of seizing their food. Notwithstanding this diversity, M. Vaillant states that the eight cervical vertebræ can always be readily distinguished from those of other parts of the vertebral column.

The greater portion of the article is taken up by technical description and comparison of these bones in the various species examined, but a resume, with a diagrammatic tableau, brings clearly out the principal points of structure. Procœlian, opisthocœlian, amphicœlian and amphicyrtian or double-convex vertebræ occur in this region, the two former in greatest number. Amphircyrtian double convex vertebræ are often wanting; when there are two, one is always the eighth, but the other varies in position; as do also the single amphircyrtian double-convex vertebræ of other species.

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[1] *Memoirs sur la Disposition des Vertebres Cervicales chez les Chelonians.* Par M. LEON VAILLANT. (Présenté a l'Academie des Sciences le 15 Nov. 1880, Annales Sci. Nat. Zool., Art. No. 7.)

Ginglymoid articulations vary also from three to none, but their position is always between the hindermost vertebræ. These ginglymoid articulations have direct relation to the mode in which the neck is retracted, since they permit only movements of flexion and extension; thus it is easy to comprehend their absence among the pleurodεres, in which the retraction of the neck is performed by a deduction. The marine turtles have only one ginglymoid articulation, and thus in this respect stand between the pleuroderes and the true cryptoderes, which have two or three.

The Trionychidæ have only one or two ginglymoid articulations, but their fewness is more than counter-balanced by the perfect supplementary ginglymus presented by the dorso-cervical articulation. From the possession of this peculiarity the Trionychidæ constitute a type apart from other Chelonians.

The variations in the double-convex vertebræ in forms, evidently nearly related, renders their physiological function less easy to determine, yet it is evident they play an important part in the retraction of the neck. The marine turtles possess but one of these vertebræ, and this has but slight convexities.

The Chelydras, Cinosternes and Staurotypes have also but one, with convexities more prominent than in the marine turtles (Thalassians), and in these tortoises, especially the first group, the retraction of the neck is incomplete, although more perfect than in the marine turtles. The true cryptoderes, Testudo, Emys, Cistudo, Terrapene, etc., have two such vertebræ; while the pleuroderes with long necks have two; those with shorter necks one. M. Vaillant does not venture to assign a reason for the variable position occupied by these double-convex vertebræ, since it is not constant even in the same genus.

M. Vaillant promises to follow up his valuable researches upon the hard parts by a study of the actual mode of articulation and of the muscles. Not only is the mode of articulation very variable in the different species, but even in the same individual, and it is difficult to bring some of them under the generally admitted varieties.

In most cases the atlas is distinct from the odontoid process, which is united by a close amphiarthrosis to the second vertebra, and movements are effected by articulations which unite it to the three portions of the atlas, which in very old individuals is a single bone. In most pleuroderes the odontoid apophysis is firmly united to the atlas, and movement is limited to that possible between the adjoining facets of the odontoid and atlas, but in *Elseya latisternum* the odontoid process is distinct. On the other hand, *Cycloderma aubryi* among the Trionychidæ has these parts united to that any extended movement seems impossible.

M. Vaillant does not consider the retraction or non-retraction of the neck a leading character, and prefers to keep the usual classification into the three great families of Cheloniida, Trionychidæ, and Testudinidæ. The first of these includes the Thalassians and the Chelodinæ (pleuroderes), the second the Trionychidæ only; the third the Chelydina (pleuroderes) and Chersemydina, which last group embraces the incompletely cryptodere Chelydreæ and the truly cryptodere Testudineæ.

Whatever difference of opinion there may be upon the value of certain characters in classification, we will not deny the force of M. Vaillant's argument, which is as follows:

"When we consider that animals as intimately related as are *Testudo pusilla* and *Pyxis arachnoides* present really important differences in the constitution of the cervical part of the back bone, we cannot but place a great distinction between genera established from the elements at the disposal of the palæontologist and those established by the more complete study of the whole structure of living animals."

ALLEN'S HUMAN ANATOMY.[1]—The object of the author of this work is to present the facts of human anatomy in the manner best suited to the requirements of the student and practitioner of medicine. It is, in fact, intended to be a physician's human anatomy, not one for the use of the scientist or the surgeon, for one or the other of whom most works upon anatomy have been written. As surgical and general medical practice are not separated from each other in this country to the same extent that they are in Europe, the author believes rightly that there is room for a work which shall accurately and concisely express the present state of anatomical science, including every application thereof needed by the physician.

The form and construction of the human body, the variations in the condition of the various organs within the limits of health, the relations of the parts to each other, both topographically and clinically; the uses of the organs, and the nature and general behavior of morbid processes with the manner in which they are modified by locality, should all be known to the physician, and will obtain ample treatment in this work. Aware that some of these desiderata trench upon physiology, Dr. Allen engages only to treat of them from an anatomical point of view. Those scientists who are not physicians will be pleased to find that the work

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[1] A System of Human Anatomy, including its medical and surgical relations. By Harrison Allen, M.D. Philadelphia: Henry C. Lea's Son & Co., 1882.